

ZOOLOGY.—Notes on the trematode subfamily *Loimoinae* (*Monogenea*), with a description of a new genus.¹ HAROLD W. MANTER, University of Nebraska. (Communicated by WALDO L. SCHMITT.)

The subfamily *Loimoinae* was named by Price (1936) for a peculiar monogenetic trematode, *Loimos salpinggoides* MacCallum, 1917, from the gills of a dusky shark, *Carcharias obscurus* (Lesueur), at Woods Hole, Mass. Price (1938) redescribed this trematode, correcting several errors made by MacCallum. Manter (1938) described *Tricotyle scoliodoni* from a shark, *Scoliodon tetrarhynchus* (Richardson), from Beaufort, N. C. He noted some similarities between *Tricotyle* and *Loimos*. The redescription of *Loimos* by Price increased these similarities.

Among specimens of trematodes collected by the late Dr. C. B. Wilson and sent to me for identification was a monogenetic species collected from the gills of the hammerhead shark, *Sphyrna zygaena* (Linnaeus), at Montego Bay, Jamaica, in 1910. This trematode proved to be related to *Loimos* and *Tricotyle* and led to a comparative study of type and paratype specimens of all three species. This study revealed the need for additions to the descriptions of both *Loimos* and *Tricotyle* and indicated the reduction of *Tricotyle* to synonymy with *Loimos* and the erection of a new, closely related genus. The author is indebted to the National Museum (more particularly to Dr. Waldo L. Schmitt and Dr. Paul Bartsch) for loan of original material, and to Dr. Emmett W. Price, of the Bureau of Animal Industry, for several suggestions.

The following additions can be made to the description of *Loimos salpinggoides*: (1) A vagina is present, extending forward from the ootype slightly to the left of midline, parallel or almost parallel with the uterus and cirrus, and opening on the ventral surface to the left of midline a short distance posterior to the male pore (Fig. 5). It is less glandular, thinner walled, and much less conspicuous than in *Tricotyle*. (2) The number of testes seems to be 8 or 9; these are rounded, tandem, and pressed

very close together but separated by membranes. (3) An anterior portion of the pharynx with circular muscles is distinctly demarked from the larger posterior portion with the characteristic thick muscular bands. Some indication of this anterior sphincter is seen in MacCallum's and Price's figures. (4) On the dorsal surface of the body near the posterior end and dorsal to the haptor are two pairs of transverse (or diagonally transverse) cuticular folds or ridges with sharp edges (Fig. 6). High magnification reveals that the edges of these folds (Fig. 7) are provided with very small sharp papillae or spines (like a file). The folds are fairly conspicuous, appearing (in the strongly pressed specimens) as diagonal lines. They extend inward from the sides of the body but do not quite reach the midline. These sharp-edged ridges are the same structures as the two dorsal, shallow cup-shaped structures described for *Tricotyle*. Since the *L. salpinggoides* specimens were killed under excessive pressure, the ridges are probably normally somewhat elevated as described for *Tricotyle*.

In view of the above conditions, it seems probable that *Loimos* and *Tricotyle* represent a single genus. *Tricotyle* Manter, 1938, should be considered a synonym of *Loimos* MacCallum, 1917. A revised diagnosis of the genus will be given below. *Loimos salpinggoides* MacCallum, 1917, and *Loimos scoliodoni* (Manter, 1938), n. comb., can be distinguished in that *L. salpinggoides* possesses two pairs of suckers (rather than one pair) in the anterior haptor; is smaller in size; and has a much less conspicuous (thin-walled, less glandular) vagina, relatively longer cirrus, and more numerous, more rounded testes. The actual, normal condition of the ovary in *L. salpinggoides* is still not clear. The organ seems to be rather compact, but its cells are well scattered, its outline rather uncertain, so that it may actually be essentially like the irregularly shaped ovary of *L. scoliodoni*. In *L. salpinggoides* the shell gland is more conspicu-

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ous than the prostate gland (cells of which are immediately anterior to the shell gland), while in *L. scoliodoni* the prostate gland is the more conspicuous. A shell gland, however, is definitely present in *L. scoliodoni* although not indicated in the original description.

The third species (from the hammerhead shark) is clearly related to *Loimos* but is probably sufficiently distinct to warrant a separate genus. The following description is based on about 25 specimens in rather poor condition. The measurements are from 5 of the more favorable specimens.

Loimosina wilsoni, n. gen., n. sp.²

Figs. 1-4

Host.—*Sphyrna zygaena* (Linnaeus).

Location.—Gills.

Locality.—Montego Bay, Jamaica.

Specimens.—U.S.N.M. Helminthological Coll. 36861 (type and paratypes).

Description.—Muscular parasites of this type can exhibit a great range in body size and proportions depending on degree of contraction. The present specimens were apparently not pressed at all in killing.

Size 0.875 to 2.389 mm by 0.750 to 0.772 mm, greatest width near midbody. Anterior haptor 0.140 to 0.190 mm in transverse diameter. In the dorsal wall of this haptor are three pairs of muscular loculi opening ventrally or ventrolaterally (Fig. 2). The median pair of loculi is larger than the others. Posterior haptor 0.345 to 0.517 mm in transverse diameter, bearing one pair of large hooks (Fig. 3) and a number of very minute hooks. There are very inconspicuous, more or less radially arranged bands of transverse fibers within the haptor. Large hooks (two were measured), 0.046 to 0.053 mm long; outer root long and slender; inner root short and wide.

Mouth at the base of a slight posterior extension of the anterior haptor. Pharynx 0.172 to 0.225 mm long by 0.120 to 0.172 mm wide, transversely ribbed; with very weak, inconspicuous anterior sphincter (not visible in some specimens). Caeca unbranched, bowing outward from base of pharynx, then extending to

near the posterior end of the body where they end blindly. Testis large, single, very deeply multilobed. These lobes seem to be connected at least medianly so that the testis is considered as single. The male pore is a median or submedian, transverse slit ventral to the posterior portion of the pharynx. A large, ovoid, relatively wide, cirrus-sac-like organ extends dorso-posteriorly from the pore and encloses a lightly fibrous tissue (probably the tall, thin-walled cells described for *L. scoliodoni*) and, in its base, a small spherical, internal seminal vesicle. While this sac appears to be a cirrus sac, I interpret it to be homologous with the "ejaculatory bulb" described for *L. salpingoides*. The cirrus is rudimentary, consisting of a very short, very thinly chitinized tube near the male pore. Whether this cirrus is enclosed within the ejaculatory bulb or is external to the tip of the bulb (as in *Loimos*) could not be determined. The external seminal vesicle extends anteriorly along one side of the ejaculatory bulb, crosses to the other side dorsal to anterior portion of the bulb, then extends posteriorly to the base of the bulb. Prostatic gland external to bulb, large, bilobed, one lobe on each side at base of pharynx.

Ovary immediately pretesticular, tubular, and branched. Mehlis's or shell gland small, immediately preovarian. Vagina conspicuous, with thick glandular wall, extending diagonally to the left approximately opposite ejaculatory bulb; vaginal pore large, ventral, midway between midline and left edge of body, about midway between base of pharynx and the ovary, sometimes opposite base of pharynx. Vitellaria of numerous follicles filling sides of body from near anterior end of pharynx to near posterior end of body, dorsal and ventral to caeca, crowding the testis laterally, confluent posterior to testis but in this region they are chiefly dorsal. Transverse vitelline ducts at anterior edge of ovary. Uterus short; uterine pore inconspicuous, round or ovoid, immediately posterior to male pore. An egg, perhaps not fully formed, 54 μ by 48 μ , occurred in only one specimen. A filament was not evident.

Excretory bladders on each side of anterior half of pharynx.

Discussion.—The genus *Loimosina* differs from *Loimos* in its single deeply lobed testis; its rudimentary cirrus; its relatively larger ejaculatory bulb. The anterior sphincter of the

² The generic name indicates similarity to *Loimos*; the specific name is in honor of the late Dr. C. B. Wilson.

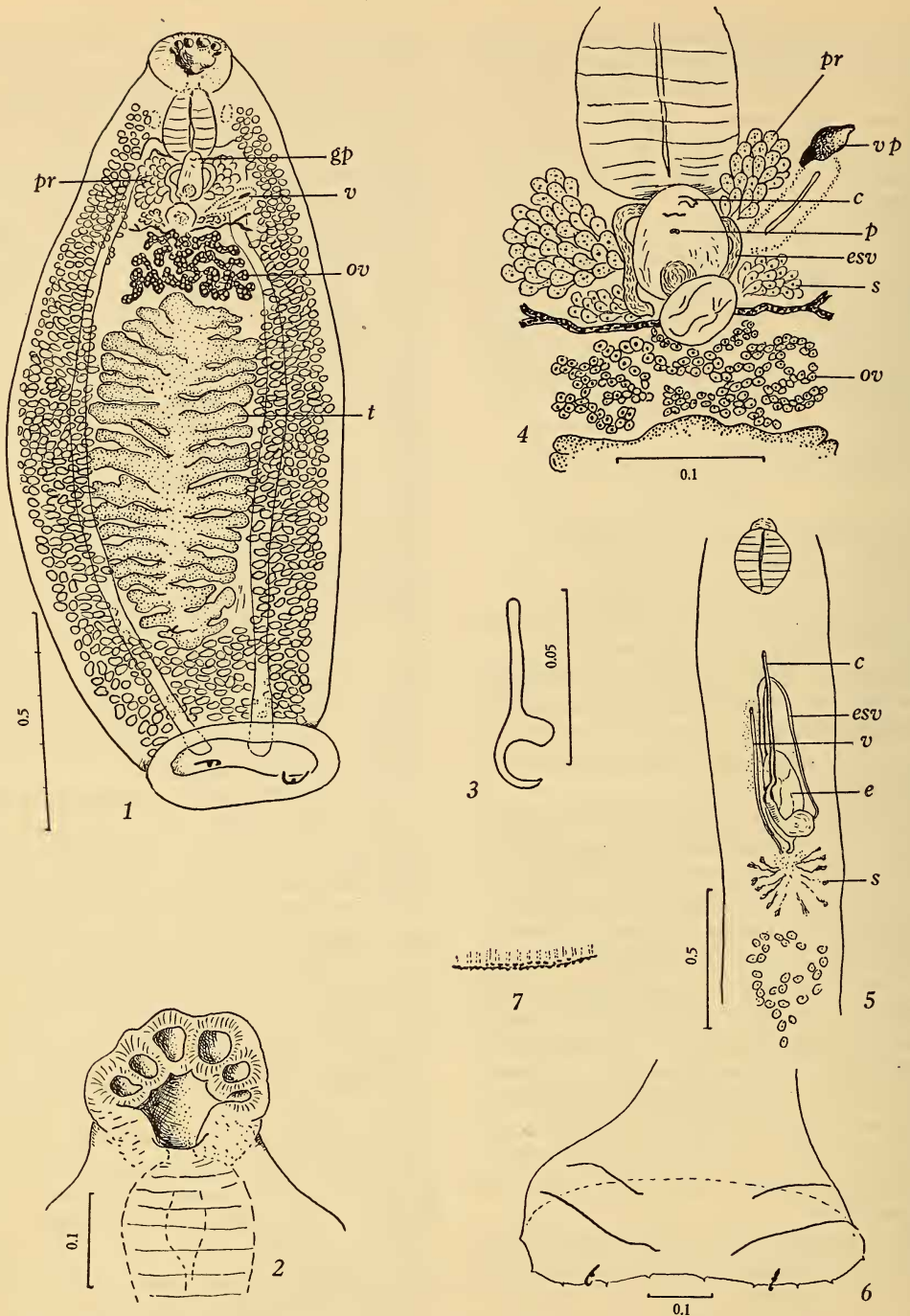


Fig. 1.—Ventral view of *Loimosina wilsoni*. Fig. 2.—Enlarged view of anterior end of *L. wilsoni*, showing preoral loculi or suckers. Fig. 3.—Large hook from posterior haptor of *L. wilsoni*. Fig. 4.—Ventral view of genital complex in region of genital pore of *L. wilsoni*. Fig. 5.—Dorsal view of genital complex of *Loimos salpinggoides*, showing vagina. Fig. 6.—Dorsal view of posterior end of *L. salpinggoides*, showing dorsal, cuticular ridges. Fig. 7.—Enlarged view of the edge of one of the cuticular ridges of *L. salpinggoides*.

All figures were drawn with the aid of a camera lucida. The projected scale has the value indicated (in millimeters). The abbreviations are as follows: c, cirrus; e, egg; esv, external seminal vesicle; gp, male genital pore; ov, ovary; p, uterine pore; pr, prostate gland; s, shell gland; t, testis; v, vagina; vp, vaginal pore.

pharynx is less evident. The mouth seems to be within the anterior haptor rather than slightly posterior to it. The dorsal cuticular ridges of the posterior end were not seen in *Loimosina*. Most specimens, however, were not favorable to show these structures. If present, they are probably weakly developed.

Price classified the subfamily Loimoinae in the family Monocotylidae. Relationships to other Monocotylidae are seen in the character of the posterior haptor, in the digestive system, and in the terminal male organs. The chief difference from other Monocotylidae is the form of the ovary, which is not U-shaped and does not send a loop around one caecum, but has an irregular form, at least usually consisting of loose cells in sinuous branching tubes.

The following diagnoses are suggested:

Loimoinae: Monocotylidae with ovary not U-shaped and not sending a loop around one caecum, but consisting of loose cells usually in sinuous tubes; anterior haptor with one to three pairs of loculi or preoral suckers; posterior haptor with one pair of large hooks and numerous small hooks; eye spots lacking; two pairs of dorsal, posterior, transverse, cuticular ridges usually present; pharynx with wide muscular bands and anterior sphincter; caeca simple; male pore and uterine pore median, near together; vagina present; vaginal pore ventral, to left of midline; several tandem testes, or single

testis; ejaculatory bulb and chitinous cirrus present; prostatic gland present; external seminal vesicle with ascending and descending sections, crossing cirrus or ejaculatory bulb dorsally; uterus short and straight; egg typically with filament; parasites on gills of sharks.

Loimos: Loimoinae with one or two pairs of preoral suckers; cirrus well developed; several tandem testes; dorsal, posterior, cuticular ridges well developed. Type species: *Loimos salpinggoides* MacCallum, 1917.

Loimosina: Loimoinae with three pairs of preoral suckers; cirrus rudimentary; testis single, deeply lobed; prostatic bulb well developed; posterior cuticular ridges inconspicuous or lacking. Type species: *Loimosina wilsoni*.

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ZOOLOGY.—*Description of a new species of Amphipoda of the genus Anisogammarus from Oregon*.¹ CLARENCE R. SHOEMAKER, U. S. National Museum.

When recently looking up specimens of *Anisogammarus ramellus* among the unidentified Amphipoda in the collection of the National Museum, I noticed examples of this genus from Big Creek, Lincoln County, Oreg., possessing characters quite different from those of *A. ramellus*. Upon study, these specimens proved to represent a new species, which I here describe and designate as *Anisogammarus oregonensis*. Heretofore, *A. ramellus* (Weckel) has been the only species described from the fresh waters of North America. Four fresh-water species of this genus have been described: *A. ramellus* (Weckel), known from Cali-

fornia and Oregon; *A. annandalei* (Tattersall), from China and Japan; *A. kygi* (Dershavin), from Kamchatka; and *A. jesoensis* Schellenberg, from Jeso, Japan. *A. oregonensis* appears to resemble most closely *A. jesoensis* but is distinguished at once from it by the possession of a much more elaborate dorsal armature of the metasome and urosome and by the absence of plumose setae from the third uropods.

Anisogammarus (Eogammarus) oregonensis,
n. sp.

Male.—Head scarcely produced into a rostrum; side lobes broadly truncate, with upper and lower corners evenly rounding; eye rather large, reniform, and black. Antenna 1 about two-thirds the length of the body; second joint

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